

REMARKS

Applicants have amended the specification and claim 46 to correct typographical errors and have amended claims 3, 10, 11, 12, 21, and 22, to correct an antecedent basis problem and claim 1 for the reasons set forth below. In view of the above amendments and the following remarks, reconsideration of the outstanding office action is respectfully requested.

The Office has objected to claims 3, 10, 14 and 22 asserting the limitation "the set of color filters," does not appear in claims 1, 12 and 22 and that in the event that claims 10 and 22 are amended to state that the set of filters correspond to the set of non-interference filters, claims 10 and 22 would then be non-limiting as claims. Accordingly, as set forth above, claims 3, 10, 11, 21, and 22 have been amended to remove the term "color" and have amended claims 10, 11, 21, and 22 to be proper dependent claims. In view of the foregoing amendments and remarks, the Office is respectfully requested to reconsider and withdraw this objection.

The Office has rejected claims 1-22 under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,864,364 to Ohyama et al. (Ohyama) in view of US Patent No. 5,347,378 Handschy et al. (Handschy), claims 8, 9, 19 and 20 under 35 U.S.C. 103(a) as being unpatentable over Ohyama in view of Handschy and further in view of US Patent No. 6,256,067 to Yamada (Yamada) and claims 37-50 under 35 U.S.C. 103(a) as being unpatentable over Ohyama in view of US Patent No. 5,748,236 to Shibazaki (Shibazaki). Ohyama discloses an apparatus for multi-spectral image capture having: two or more color channels (Figure 4); each of the channels having a different spectral sensitivity (Figure 7A); the image acquisition system acquiring a first series of images of the first scene (Figure 7B; c.7, II. 48-50; c. 9, II. 54-65) and a set of filters (Figure 4, Item 2), each of the filters having a different spectral transmittance (Figure 7A) and being positioned between the scene and the image acquisition system (Figure 4), the filters filtering a different image in series of images (Figure 7B; c. 9, II. 54-65). The Office acknowledges that Ohyama does not disclose filters which are non-interference filters, but asserts that Handschy discloses a selective filter apparatus (e.g. Figure 1) for use in camera systems (Figure 6a) which can be of either absorption (i.e. non-interference) or interference type (c. 4, II. 63-66; c. 17, II. 50-59) and have faster switching response times than mechanical color wheel filter systems (c. 1, I. 39 - c., I. 2; c. 4, II. 54-66). The Office also asserts that Ohyama discloses generating a characteristic mapping from the second series of filtered images (c. 11, II. 12-37; Figure 13,

“ $L(\lambda)$ ”). Additionally, the Office asserts that Ohyama discloses an apparatus for multi-spectral image capture with: one image acquisition system having two or more color channels (Figure 4), each of the channels having a different spectral sensitivity (Figure 7A) and the use of a color filter wheel to create multi-spectral images (Figure 4, Item 2). The Office acknowledges that Ohyama does not disclose a set of two or more illuminants, but asserts that Shibazaki discloses a camera in which a color filter wheel for creating individual images of different colors is replaced by a set of illuminants (Figure 12), where each of the illuminants has a different spectral power distribution (c. 15, II. 4-18).

Ohyama, Handschy, Yamada, and Shibazaki, alone or in combination, do not disclose or suggest, “each of the non-interference filters . . . is positioned between the scene and the one or more image acquisition systems” as recited in claim 1 or “a set of non-interference filters . . . is positioned between the scene and the image acquisition system” as recited in claim 12. The Office’s attention is respectfully directed to col. 5, lines 32-33 in Ohyama which states, “FIG. 4 is a view of the arrangement of a multispectral camera 10 employing a rotary filter.” Accordingly, what is illustrated in FIG. 4 in Ohyama are the elements of a camera 10. As clearly illustrated in FIG. 4 of Ohyama, the rotary color filter 2 is inside this camera 10 between the optical system 1 and the CCD 3. As a result, the rotary color filter 10 is not between the scene and the image acquisition system as claimed. Like Ohyama, Handschy, Yamada, and Shibazaki also do not disclose or suggest positioning the non-interference filters between the scene and the one or more image acquisition systems.

In contrast, with the present invention, as described at page 9, lines 3-6 in the above-identified patent application, “[E]ach of the non-interference filters 16(1)-16(n) is located or positioned between the scene 20 and an aperture, opening, or other imaging surface for one of the image acquisition systems 12(1)-12(n).” Accordingly, the present invention discloses placing the filters in front of any imaging optics into the image acquisition system, not within the image acquisition system. Further, as disclosed at col. 9, lines 7-9 in the above-identified patent application, “The non-interference filters 16(1)-16(n), may be connected to or spaced from each of the image acquisition systems 12(1)-12(n).” Again, the filters of the present invention are clearly described as being outside of the image acquisition system. Therefore, in view of the foregoing amendments and remarks, the Office is respectfully requested to reconsider and withdraw the rejection of claims 1 and 12. Since claims 2-11 depend from and contain the limitations of claim 1 and claims 13-22 depend

from and contain the limitations of claim 12, they are distinguishable over the cited references and patentable in the same manner as claims 1 and 12.

Ohyama, Handschy, Yamada, and Shibazaki, alone or in combination, do not disclose or suggest, “generating a characteristic mapping from two or more color channel signals from the second series of filtered images” as recited in claim 4 or “. wherein the spectral image processing system generates a characteristic mapping from two or more color channel signals from the second series of filtered images” as recited in claim 15. The Office’s attention is FIG. 7B and col. 11, line 14 to col. 12, line 19 in Ohyama which illustrates and discloses that Ohyama’s transformation is from spectral distribution or radiance ($S(\lambda)L(\lambda)$), not from color channel signals as claimed. Like Ohyama and Shibazaki, Handschy and Yamada also do not disclose or suggest generating a characteristic mapping from two or more color channel signals as claimed. Accordingly, in view of the foregoing amendments and remarks, the Office is respectfully requested to reconsider and withdraw the rejection of claims 4 and 15. Since claims 5-7 depend from and contain the limitations of claim 4 and claims 16-18 depend from and contain the limitations of claim 15, they are distinguishable over the cited references and patentable in the same manner as claims 4 and 15.

Ohyama, Handschy, Yamada, and Shibazaki, alone or in combination, do not disclose or suggest, “each of the image acquisition systems having two or more color channels . . . illuminating each image of the first series of images with a different illuminant from a set of two or more illuminants” as recited in claim 37 or “an image acquisition system having two or more color channels . . . a set of two or more illuminants” as recited in claim 44. The Office asserts that it would have been obvious to one of ordinary skill in the art to replace the color filter wheel shown in FIG. 4 in Ohyama with the set of three illuminants shown in FIG. 12 of Shibazaki. However, contrary to the Office’s assertions this combination does not disclose or suggest the claimed invention. Once the rotary color filter 2 in FIG. 4 of Ohyama is removed to be replaced by the set of illuminates shown in FIG. 12 of Shibazaki, the CCD 3 is only a single channel device. As a result, the suggested combination of the cited references by the Office does not disclose or suggest both an image acquisition system which has two or more color channels and a set of two or more illuminates. Further, in the combination suggested by the Office there is no teaching, suggestion, or motivation in the cited references to keep the rotary color filter 2 with the CCD 3 in Ohyama and then to also add the set of three illuminates from Shibazaki to this system. . Like Ohyama and

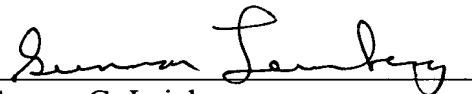
Shibazaki, Handschy and Yamada do not disclose or suggest both an image acquisition system which has two or more color channels and a set of two or more illuminates as claimed.

In contrast, the present invention discloses an example of such a combination at page 11, lines 10-14 in the above-identified patent application, "For example, a single image acquisition system 12 could be used to capture each image or image view 48(1)-48(n) with the multiple filters 16(1)-16(n) and/or illuminants 18(1)-18(n)." Accordingly, in view of the foregoing amendments and remarks, the Office is respectfully requested to reconsider and withdraw the rejection of claims 37 and 44. Since claims 38-43 depend from and contain the limitations of claim 37 and claims 45-50 depend from and contain the limitations of claim 44, they are distinguishable over the cited references and patentable in the same manner as claims 37 and 44.

In view of all of the foregoing, applicant submits that this case is in condition for allowance and such allowance is earnestly solicited.

Respectfully submitted,

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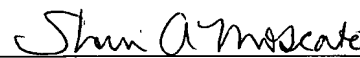
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